BY ORDER OF THE COMMANDER
926TH FIGHTER WING

926th FIGHTER WING INSTRUCTION 21-120

27 April 2000

Maintenance

TURBINE ENGINE MONITORING SYSTEM/ ENGINE DIAGNOSTICS SYSTEM

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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Supersedes 926 FWI 21-120, 30 January 1997
Pages: 4
Distribution: F:

This Fighter Wing Instruction (FWI) implements AFPD 21-1, *Managing Aerospace Equipment Maintenance*, and establishes procedures and responsibilities for the management of aircraft engines under the Turbine Engine Monitoring/Engine Diagnostics System (WCEMS IV/ED). Commanders, supervisors and personnel of the 706th Fighter Squadron Maintenance (FSM) and the 926th Maintenance Squadron (MXS) ensure compliance with this instruction.

SUMMARY OF REVISIONS

This revision revises series number and information throughout entire instruction; updates format, directives, Office of Primary Responsibility (OPR), certifying and approving authority. An (|) indicates revisions for the previous edition.

1. Description . The TEMS/ED is a network of various probes, sensors, transducers, etc., that monitor engine performance, at all levels of operation, through the use of an aircraft mounted computer system, maintenance documentation, and Oil Analysis Program (OAP) data. After being extracted from the on-board processor by engine/flight line personnel, the data is transmitted, via the Data Collection Unit (DCU), to the Host System Computer located in the Engine Shop. The data is then compiled and processed for use by managers, at all levels.

2. Policy . The Turbine Engine Monitoring/Engine Diagnostics System (WCEMS IV/ED) forms an integral part of the overall TF34-100A engine maintenance management plan. As a source of engine condition information, the WCEMS IV/ED is at the center of the communication network necessary to implement an effective engine support and management program. To provide an effective engine management system, a coordinated effort is required among personnel involved in the use of the system, to

include the Engine Management Branch (EMB), Propulsion Branch, FSM and Oil Analysis Program (OAP) laboratory.

3. Responsibilities . It is the responsibility of the 926th Maintenance Squadron Commander to ensure all affected agencies perform their assigned duties, in order to gain the maximum benefit from WCEMS IV/ED, so it is responsive to the needs of all users.

3.1. The Engine Shop will:

3.1.1. Be the OPR for the overall management and operation of the WCEMS IV/ED system.

3.1.2. Be the point of contact for the reporting and resolution of system problems (i.e., communications error with host, software deficiencies and hardware malfunctions).

3.1.3. Establish a host system files maintenance schedule which will include, but not limited to the following functions. Recommended schedule for all functions can be found in the operator's manual.

3.1.3.1. Update. Must be accomplished daily, to enter data from previous flying day into host system.

3.1.3.2. Load Alarms. Must be accomplished daily, prior to the analysis of data.

3.1.3.3. Backup Database. Must be accomplished daily, in the event of host system failure.

3.1.3.4. Parts Life Tracking (PLT) Data. PLT data is downloaded daily and given to the Engine Manager to update the Engine Central DataBase, Tinker AFB, Oklahoma.

3.1.3.5. Critical Component Life (CCL). Will be accomplished, as needed, to load CCL data into the host system.

3.1.4. Analyze generated alarms, to determine validity and advise the Propulsion Flight Chief. The effected FSM will be notified initially by telephone, with a follow-up transaction in Core Automated Maintenance System (CAMS), to schedule maintenance.

3.1.5. Provide training for deployed engine managers on the installation, use and care of the GSU, at the deployed location.

3.1.6. Conduct a health analysis, prior to deployment, on those engines selected to deploy. This procedure will identify the best candidates for deployment and alleviate problems at the deployed location. Health, Watch List, Rank/Trend and Plot can be helpful in determining engine health and can be found in the user's manual.

3.2. Propulsion Flight/WCEMS IV/ED Monitor will:

3.2.1. At the end of each flying day, extract data from those aircraft that have flown. Data must be processed in the Engine Shop. Additionally, data must be extracted any time an engine, or tracked component, is removed and replaced. This also applies to operations at deployed locations.

3.2.2. Review the alarm status of assigned engines, on a daily basis. At this time, a determination will be made as to which engine will be put on the watch list. The alarm list will then be edited accordingly.

3.2.3. Enter any maintenance actions that could impact engine performance into the SIGNIFICANT MAINTENANCE function of the computer. Detailed instructions are located in operator's manual. This is an important function since a record of maintenance could be valuable in troubleshooting procedures.

3.2.4. Ensure correct engine documentary data during the programming of the Diagnostics Display Unit (DDU) and the Data Collection Unit (DCU), at engine installation. Current engine data can be obtained from the Engine Management Branch.

3.3. The FSM will:

3.3.1. Identify, in writing to the EMB, a primary and alternate WCEMS IV/ED monitor.

3.3.2. Ensure the crew chief performs a status check on the Umbilical Display Unit (UDU), located in the front wheel well, during preflight, thruflight and postflight inspections. If the UDU indicates a discrepancy, an entry will be made on the AFTO From 781A, **Maintenance Discrepancy and Work Document**, citing the discrepancy code, and CAMS. Codes can be found in Technical Orders (T.O.s) 1A-10A-2-71JG-6, *Power Plant Turbine Engine Monitoring System*, and 1A-10A-2-34JG-8, *Instrument System Turbine Engine Monitoring System*, and are listed as level 2 (grounding) or level 1 (discrepancies).

3.4. The Fabrication Flight OAP Laboratory will be responsible for the timely input of spectrometer sample readings, including transmitting readings to the Host Computer System, and perform the following functions, on a daily basis. Detailed instructions are in the OAP managers user's manual.

3.4.1. Set options for OAP session.

3.4.2. Enter OAP for all samples.

3.4.3. Edit OAP, as needed.

3.4.4. Display alarms and notifies flight line personnel and the Propulsion Flight Chief.

3.4.5. Transmit data to the host system at the end of a session.

3.4.6. At propulsion flt option send data file instead of performance above listed steps.

3.5. Deployed Managers will:

3.5.1. Report to the EMB for a briefing on procedures for WCEMS IV/ED and the care and handling of the GSU at the deployed site.

3.5.2. Obtain a copy of WCEMS IV/ED formatting diskettes, spare floppy diskettes and copies of the user's and terminal operator's manuals.

3.5.3. Ensure the proper installation of the GSU. This is an important function since the hard disk, in the computer, is very sensitive to movement and easily damaged. Detailed instructions on the movement and installation of the unit can be found in the user's manual.

3.5.4. Adhere to the same procedures as at home station. The only exception will be, a final archive diskette will be made prior to the disassembly of the GSU, for return to home station. Archiving procedures can be found in T.O. 1A-10A-71MS-1, *Maintenance Support Power Plant*.

3.5.5. Ensure, on extended deployments, WCEMS IV data is e-mailed, at least daily, on floppy diskettes, back to home station for update of the Host Computer System.

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